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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,700	08/25/2003	Masahiko Kubota	03500.015453.2	1549

5514 7590 03/23/2006

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
LIANG, LEONARD S	

ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/646,700	KUBOTA ET AL.	
	Examiner	Art Unit	
	Leonard S. Liang	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28,30-36 and 39-46* is/are pending in the application.

4a) Of the above claim(s) *22-28* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21,30-36 and 39-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 August 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/878,946.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 08/25/03, 10/01/03, 02/27/04, 05/05/05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

This application contains claims 22-28 drawn to an invention nonelected with traverse in the response to election/restriction filed on 01/05/06. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01. The applicant's arguments are well received and the examiner agrees with the applicant that the examiner's assertion seems to ignore the claim language of Claim 22. However, that does not change the fact that Inventions I (as drawn to claims 1-21, 30-36, and 39-46) and II (as drawn to claims 22-28) are related as product and process of use, and as such, are subject to a proper restriction requirement. In retrospect, the examiner probably could have stated the case more clearly. What the examiner was trying to get at is that the process for using the product as claimed can be practiced with another materially different product. While the applicant is right that claim 22 does disclose a method using a solid semiconductor element, the method does not necessarily dictate that the semiconductor element of claims 1-21, 30-36, and 39-46 must be used. Another semiconductor sensor could be used, for example a sensor that doesn't acquire information relating to chemical property information of the liquid, but rather a sensor which acquires some other type of information regarding the liquid. Therefore, invention II still represents a process for using the product which could be practiced with another materially different product. Therefore, the prior restriction requirement was proper. The previous restriction requirement is now made final. Claims 1-21, 30-36, and 39-46 have been elected and will herein be examined.

Specification and Drawings

The lengthy specification and drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification and drawings. Specifically, the applicant is required to match all references in the drawings to the references in the specification.

Claim Objections

Claim 39 is objected to because of the following informalities: The claim discloses "An ink tank in which at least one of solid semiconductor elements..." This is not proper grammar. It will be construed that the claim should state "An ink tank in which at least one of **the** solid semiconductor elements..." Appropriate correction is required.

Claim Rejections - 35 USC § 102

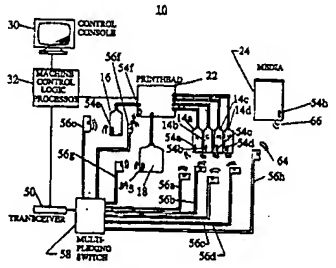
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 11-12, 16-18, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Siwinski et al (US PgPub 20020015066).

Siwinski et al discloses:

- {claim 1} A solid semiconductor element disposed in contact with a liquid (paragraph 0015 and 0055); information acquiring means for acquiring chemical property information of the liquid, including at least one of a hydrogen ion concentration index, a concentration, and a density of the liquid (Table 1); information communication means for displaying or transmitting the information acquired by the information acquiring means to the outside (figure 2, reference 54a-h, 56a-h); energy converting means for converting an energy applied from the outside to an energy of a type different from the type of the applied energy to operate the information acquiring means and the information transmission means (paragraph 0015)



- {claims 2 and 17} information storing means for storing information to be compared with the acquired information (paragraph 0014; memory); discrimination means for comparing the acquired information with the corresponding information stored in the information storing means, and discriminating a need for transmission of the information to the outside (paragraph 0015); wherein the information communication means displays or transmits the acquired information to the outside, when the discrimination means discriminates the need for the information transmission (paragraph 0038); the

information storing means and the discrimination means are operated by the energy converted by the energy converting means (paragraph 0015)

- {claims 3 and 18} information storing means for storing the information to be compared with the acquired information (paragraph 0014; memory); receiving means for receiving a signal from the outside (figure 2, reference 54a-h, 56a-h); discrimination means for allowing the information acquiring means to acquire the information about the liquid contained in the container in response to the signal received by the receiving means, comparing the acquired information with the corresponding information stored in the information storing means, and judging whether or not the acquired information meets a predetermined condition (paragraph 0014-0024); wherein the information communicating means displays or transmits at least a discrimination result obtained by the discrimination means to the outside (figure 2, reference 54a-h, 56a-h); the information storing means, the receiving means, and the discrimination means are operated by the energy converted by the energy converting means (paragraph 0015)
- {claim 11} an ink tank which contains an ink to be supplied to an ejection head for ejecting the ink, wherein at least one solid semiconductor element is arranged in contact with the ink (figure 2, reference 14a-d)
- {claim 12} wherein the solid semiconductor element is in contact with the ink by being floated and disposed on an ink surface or in the ink, and the information acquiring means comprises means for detecting an ink residual amount (paragraph 0055; Table 1; "usage level")

- {claim 16} An ink tank which contains an ink to be supplied to an ejection head for ejecting the ink, comprising an ink tank compartment which contains the ink and a semiconductor element arranged in contact with the ink (figure 2, reference 14a-d, 54a-d); information acquiring means for acquiring chemical property information of the ink, including at least one of a hydrogen ion concentration index, a concentration, and a density of the ink (Table 1); information communicating means for displaying or transmitting the information acquired by the information acquiring means to the outside (figure 2, reference 54a-h, 56a-h); energy converting means for converting an energy applied from the outside to an energy of a type different from the type of the applied energy to operate the information acquiring means and the information communication means (paragraph 0015)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-5 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siwinski et al (US PgPub 20020015066) in view of Puukangas et al (US Pat 5735167).

Siwinski et al discloses:

- {claims 4-5} a solid semiconductor element (as applied to claim 1 above)

- {claims 19-20} an ink tank (as applied to claim 16 above)

Siwinski et al differs from the claimed invention in that it does not disclose:

- {claims 4 and 19} wherein the energy converting means comprises an oscillation circuit for generating a power by an induced electromotive force by electromagnetic induction with a resonance circuit disposed outside
- {claims 5 and 20} wherein the information about the liquid is given by a change of an output from the oscillation circuit

Puukangas et al discloses:

- {claims 4 and 19} wherein the energy converting means comprises an oscillation circuit for generating a power by an induced electromotive force by electromagnetic induction with a resonance circuit disposed outside (abstract; column 3, lines 47-50)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Puukangas et al into the invention of Siwinski et al. The motivation for the skilled artisan in doing so is to gain the benefit of flexibility in using alternate arrangements for measuring liquid levels (column 3, lines 48-51; oscillator is presented as an alternative embodiment). The combination naturally suggests that the information about the liquid is given by a change of an output from the oscillation circuit.

Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siwinski et al (US PgPub 20020015066) in view of Cheng (US Pat 5743138).

Siwinski et al discloses:

- {claims 6-7} a solid semiconductor element (as applied to claim 1)
- {claim 6} the solid semiconductor element in contact with the liquid by being disposed in the liquid (paragraph 0055)
- {claim 7} the solid semiconductor element is disposed in a container in contact with the liquid contained therein, and wherein the information acquiring means comprises means for detecting a residual amount of the liquid in the container (Table 1, "usage level")

Siwinski et al differs from the claimed invention in that it does not disclose:

- {claim 6} the solid semiconductor element is in contact with the liquid by being floated and disposed on a liquid surface and which has a hollow portion for floating on the liquid surface or in the liquid

Cheng discloses:

- {claims 6-7} the common characteristic of floats being hollow inside

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Cheng into the invention of Siwinski et al. The motivation for the skilled artisan in doing so is to gain the benefit of to regulate and measure liquid level (column 1, lines 19-28).

Claims 8-10 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siwinski et al (US PgPub 20020015066) in view of Imanaka et al (US Pat 6474769).

Siwinski et al discloses:

- {claims 8-10} a solid semiconductor element (as applied to claim 1 above)

- {claims 13-15} an ink tank (as applied to claim 11 above)

Siwinski et al differs from the claimed invention in that it does not disclose:

- {claims 8 and 13} wherein the information acquiring means comprises means for detecting an ion concentration of the liquid
- {claims 9 and 14} wherein the information acquiring means comprises an ion sensor
- {claims 10 and 15} wherein the information acquiring means comprises an ion selective field effect transistor

Imanaka et al discloses:

- {claims 8 and 13} wherein the information acquiring means comprises means for detecting an ion concentration of the liquid (column 48, lines 51-53)
- {claims 9 and 14} wherein the information acquiring means comprises an ion sensor (column 48, lines 51-53)
- {claims 10 and 15} wherein the information acquiring means comprises an ion selective field effect transistor (column 48, lines 51-53)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Imanaka et al into the invention of Siwinski et al. The motivation for the skilled artisan in doing so is to gain the benefit of measuring liquid density (column 48, lines 51-53).

Claims 30-33 and 39-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siwinski et al (US PgPub 20020015066) in view of Purcell et al (US Pat 6227643).

Siwinski et al discloses:

- {claim 30} A solid semiconductor element in contact with liquid (figure 2; paragraph 0015, 0055); receiving and energy converting means for receiving a signal of an electromagnetic wave from the outside of the solid semiconductor element in a non-contact manner, and converting the electromagnetic wave to a power by electromagnetic induction (paragraph 0015); information storing means for storing information to be compared with the information acquired by the information acquiring means (paragraph 0014; memory); discrimination means for comparing the information acquired by the information acquiring means with the corresponding information stored in the information storing means, and discriminating a need for information transmission when the signal of the electromagnetic wave received by the receiving and energy converting means satisfies a predetermined response condition (paragraph 0015); information communicating means for displaying or transmitting the information acquired by the information acquiring means to the outside of the solid semiconductor element when the discrimination means discriminates the need for the information transmission (figure 2, reference 54a-h, 56a-h); wherein the information acquiring means, the information storing means, the discrimination means, and the information communicating means are operated by the power converted by the receiving and energy converting means (paragraph 0015)
- {claim 31} wherein the response condition comprises an electromagnetic induction frequency (paragraph 0015)

- {claim 32} wherein the response condition comprises a communication protocol (inherent to invention)
- {claims 33} wherein the information communicating means converts the power converted by the receiving and energy converting means to a magnetic field, a light, a shape, a color, a radio wave, or a sound as the energy for displaying or transmitting the information to the outside (paragraph 0015)
- {claims 39} An ink tank in which at least one of the solid semiconductor elements is disposed in contact with ink contained in the ink tank (figure 2, reference 14a-d)
- {claim 40} wherein a response condition of the solid semiconductor element differs with an ink in the tank (Table 1, "Ink Properties")
- {claim 41} wherein the response condition of the solid semiconductor element differs with an ink color in the tank (Table 1; "colorant usage")
- {claim 42} wherein the response condition of the solid semiconductor element differs with a color material concentration of the ink in the tank (Table 1, "colorant usage")
- {claim 43} wherein the response condition of the solid semiconductor element differs with an ink property of the ink in the tank (Table 1, "Ink Properties")
- {claim 44} An ink jet recording apparatus in which a plurality of ink tanks are disposed (figure 2, reference 14a-d)

- {claim 45} communication means for transmitting/receiving an electromagnetic wave with respect to the solid semiconductor element in each ink tank (paragraph 0015)

Siwinski et al differs from the claimed invention in that it does not disclose:

- {claim 30} information acquiring means for acquiring outside environmental information concerning the liquid

Purcell et al discloses:

- {claim 30} information acquiring means for acquiring outside environmental information concerning the liquid (abstract)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Purcell et al into the invention of Siwinski et al. The motivation for the skilled artisan in doing so is to gain the benefit of optimizing printer operations (abstract).

Claims 34-35 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siwinski et al (US PgPub 20020015066) in view of Purcell et al (US Pat 6227643), as applied to claims 30 and 45 above, and further in view of Puukangas et al (US Pat 5735167).

Siwinski et al, as modified, teaches all limitations of the claimed invention except for the following:

- {claim 34} wherein the receiving and energy converting means comprises a conductor coil and an oscillation circuit for generating the power by electromagnetic induction with an outside resonance circuit

- {claim 35} wherein the conductor coil is formed to be wound around an outer surface of the solid semiconductor element
- {claim 46} wherein the communication means comprises a resonance circuit for emitting the electromagnetic wave

Puukangas et al discloses:

- {claim 34} wherein the receiving and energy converting means comprises a conductor coil and an oscillation circuit for generating the power by electromagnetic induction with an outside resonance circuit (abstract; column 3, lines 47-50)
- {claim 46} wherein the communication means comprises a resonance circuit for emitting the electromagnetic wave (column 3, lines 48-52)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Puukangas et al into the invention of modified Siwinski et al. The motivation for the skilled artisan in doing so is to gain the benefit of flexibility in using alternate arrangements for measuring liquid levels (column 3, lines 48-51; oscillator is presented as an alternative embodiment). The combination naturally suggests the conductor coil is formed to be wound around an outer surface of the solid semiconductor element.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Siwinski et al (US PgPub 20020015066) in view of Purcell et al (US Pat 6227643), as applied to claim 30, and further in view of Cheng (US Pat 5743138).

Siwinski et al, as modified, teaches all limitations of the claimed invention except for the following:

- {claim 36} a hollow portion for floating on a liquid surface or in a predetermined position in the liquid

Cheng discloses

- {claim 36} a hollow portion for floating on a liquid surface or in a predetermined position in the liquid (column 1, lines 24-28)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Cheng into the invention of modified Siwinski et al. The motivation for the skilled artisan in doing so is to gain the benefit of to regulate and measure liquid level (column 1, lines 19-28).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cook (US Pat 6158850) discloses an on carrier secondary ink tank with memory and flow control means.

Bullock et al (US Pat 5812156) discloses an apparatus controlled by data from consumable parts with incorporated memory devices.

Usui et al (US Pat 6470744) discloses a liquid detecting piezoelectric device, liquid container, and mounting module member.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S. Liang whose telephone number is (571) 272-2148. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

3/20/06

MANISH S. SHAH
PRIMARY EXAMINER

03/18/06
lsl LSL

PRIMARY EXAMINER
MANISH S. SHAH